EVALUATION OF A CONSUMER DURABLE INVESTMENT PROJECT: A FEASIBILITY STUDY

A THESIS

By

Türker ÇİFTÇİ

May, 1996

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By

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May, 1996

I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Business Administration.

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Approved by Dean of the Graduate School of Business Administration

Prof. Dr. Sübidey TOGAN

To my worderful family who dedicated their lives to us

and

To Nur

ABSTRACT

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Investment projects have to be analyzed very carefully before they have been realized. Feasibility study is the most important part of this analysis process. The aim of this study is to propose a systematic project analysis framework and by using this framework to conduct a feasibility study in a real life investment project on consumer durable industry.

Keywords: Investment projects, project analysis, feasibility study, consumer durable industry

ÖZET

BİR BEYAZ EŞYA YATIRIM PROJESİNİN ÜZERİNE FİZİBİLİTE ETÜDÜ

Türker ÇİFTÇİ

M.B.A. Yüksek Lisans Tezi

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Mayıs, 1996

Yatırım projeleri gerçekleştirilmeden önce çok dikkatli bir şekilde analiz edilmelidirler. Fizibilite etüdü bu analiz sürecinin en önemli kısmıdır. Bu çalışmanın amacı sistematik bir proje analiz çerçevesi sunmak ve bu çerçeveyi kullanarak dayanıklı tüketim malları endüstrisindeki gerçek bir yatırım projesi üzerine fizibilite etüdü yapmaktır.

Anahtar Kelimeler: Yatırım projeleri, proje analizi, fizibilite etüdü, dayanıklı tüketim malları endüstrisi

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I. INTRODUCTION

Investment projects have important influences on society. They do affect society in several aspects such as economic development and welfare of its members. In addition to the profits made by the investors, successfully implemented programs have impacts on salaries, wages and other types of revenues emerging due to these investment activities. Those revenues can be rents, taxes to the government, interests and leases. Especially, tax revenue of the government in return affects the cash flow to society.

Therefore, investment projects cannot be isolated from other sectors and even from the whole economy. Hence, risk involved in investment projects is also the risk of the society. Accumulated effects of wrong selection of large investment projects can seriously threaten the economic development of a country.

This makes project planning, selection and evaluation process (project analysis) vital. The project analysis should not only consider financial profitability but also economic profitability. Those countries which manage the process of project analysis more efficiently than the others are more likely to gain economic success and competitive advantage.

One of the most important factors that may turn an investment project into failure is that, the people making investment decisions do not use project planning, selection and evaluation techniques or they do make inadequate use of them.

Making a systematic analysis of projects before deciding to implement them may show that the investment would not yield profitable results both for the entrepreneur and for the society. Furthermore, using foreign debt in investment financing for a potentially unsuccessful project would put additional burden on the country. It may even distort the distribution of international debt balance. However, an analysis that does not justify the investment will save investor from losing dollars, direct him to more profitable projects and prevent society from negative effects of such a failure.

For the reasons stated above, governments, loaning institutions, and multinational financial institutions require detailed project analyses before giving any incentives or credits. The governments in many developing countries demand similar studies from foreign investors and/or from their domestic partners to make sure that the investment will be to the benefit of the country. This is an enforcing factor for investors to consider the whole concept of project analysis not only the financial profitability. Any enterprise considering an investment program, therefore, should justify the project using an investment evaluation technique. Feasibility study constitutes the crucial part of such techniques.

I.1. THESIS OBJECTIVES

Objectives of this study can be outlined as follows:

- to perform a literature survey on project analysis methods,
- to propose a systematic project analysis framework focusing mostly on feasibility study for investment projects,
- to apply this framework to make a feasibility analysis on a consumer durable investment project,
- determine the project viability with respect to the investor's point of view by using the results of the feasibility analysis.

In order to be systematic, the framework divides the process of project analysis into a logical order of phases starting from project conception to post-project evaluation. Each phase describes one aspect of project analysis and explains the activities to be done in that phase.

To perform the feasibility analysis, data on following items should be obtained:

- market (size, growth rate, supply and demand),
- project technology, product and process specification,
- parts and materials and their supply plans and costs,
- equipment and their costs,
- fixed project items and costs,
- location of the project,
- manpower requirements.

To get these data, I have performed following activities:

- to get market information, worked with Vestel Marketing Department;
- to determine the models to be produced, involved in a market survey;
- negotiated with a South Korean company on project technology, process flow diagram, plant layout and manpower requirements;
- negotiated with equipment suppliers, construction companies and landowners;
- to prepare the parts supply plan (determination of the parts to be subcontracted), investigated the subcontractors in İzmir and İstanbul;
- to obtain the material costs, investigated domestic and foreign suppliers of material.

1.2. THESIS OUTLINE

First chapter is the introduction and states the objectives of the thesis. Second chapter examines the literature on project analysis and feasibility studies. The literature review was helpful to establish the project analysis framework and feasibility study outline. Third chapter deals with the steps of project analysis and establishes a project analysis framework. Feasibility study phase of project analysis process is explained in greater detail. Fourth chapter is the case study. The study is about evaluating the viability of investment on a refrigerator production facility. The analysis is done according to the framework presented in chapter three. The project is appraised from investor's point of view and the effect of the investment on the investor's net cash flow is evaluated. Last chapter concludes the thesis. It contains comments on the results of the study and points to further research areas.

II. LITERATURE REVIEW

Economic and social growth of countries have been influenced by their selection of investment projects and use of project management techniques in all sectors. For this reason, there is a considerable amount of literature on managing projects. Feasibility study is seen as an important element of project analysis in most of the literature on projects and project management. Therefore, being a significant step of project analysis process, feasibility study should be discussed together with the phases of project analysis.

II.1. PHASES OF PROJECT ANALYSIS

Phases of project analysis have been explained similarly by different authors. Morris and Hough (1987) describe the activity sequence of project cycle as follows:

'every project, no matter of what kind or for what duration, essentially follows the activity sequence of ***prefeasibility/feasibility****, design and contract negotiation, implementation, handover and in-service support.'*

In a similar fashion, Culpin (1989) summarizes the stages of a capital project in the following order:

Initiation ------> Rough Costing/Technical Feasibility --------> Market Research/Costing -----> Financial and Economic Evaluation.

Just like Culpin, Morris and Hough, Sell (1991) also divides any project into several phases. First phase, naturally, is project conception. Then opportunity and pre-feasibility studies follow. After that, feasibility study consisting of techno-economic, financial and economic analyses are performed. The next phases are investment and operating activities. Finally, ex-post evaluation is performed. The framework presented in this study follows a methodology similar to this one.

Methodology of project planning proposed by Goodman (1988) also bears equivalent characteristics. The methodology, Integrated Project Planning and Management Cycle (IPPMC) is a conceptual tool for observing and analyzing the process of a project. IPPMC is divided into four phases:

- Planning, appraisal, and design
- Selection, approval, and activation
- Operation, control, and handover
- Evaluation and refinement

In this methodology, planning, appraisal and design stage is the vital part of project selection process and it consists of the following items.

- identification and formulation of project (project conception)

- feasibility analysis and appraisal (project viability)
- approval and design (project implementation)

II.2. FEASIBILITY ANALYSIS

Feasibility analysis and project appraisal are usually handled in the third phase of project cycle coming after project conception and opportunity study. These are the critical set of tasks which also involve development of preliminary designs for the project.

Goodman defines feasibility analysis as the process of determining whether the project can be implemented and describes appraisal as the evaluation of the ability of the project to succeed. He claims that projects will proceed to the feasibility stage only if decision makers find them desirable. His arguments about feasibility and appraisal are explained in the proceeding paragraph.

While feasibility analysis and appraisal are being conducted, he asserts that several decisions about the preliminary estimates of resources and size, location and technology must be made. Determining correctly the feasibility of a project depends on accuracy of the information collected. Even though the final detailed design of the project can only be undertaken after the approval, the preliminary design forms the basis for that approval.

Goodman approaches to feasibility analysis from a social/economic point of view. According to him, a complete feasibility analysis of a project must cover six important study areas:

1. technical, including manpower and technologic requirements;
2. economic justification, such as the costs and benefits;
3. administrative / managerial, including external linkages and internal organization;
4. environmental, including present baseline data and the impact of those data;
5. social / political, including demographic data and social needs;
6. financial for funding needs and sources.

He argues that each of these six studies should answer the following five interrelated questions:

- Is the proposed project responsive to social and economic needs?
- Will the project as planned adequately serve or fulfill the intended purpose without harming the environment?
- Will the benefits of the project to both society and the economy be justified by costs?
- Should various technical aspects be considered?
- Do the feasibility study provide sufficient baseline criteria and measures to establish a checklist for subsequent project implementation and evaluation?

Goodman also states that well prepared feasibility studies and analyses should examine and question every aspect of the preliminary design within the actual project environment. They determine whether the project can be satisfactorily carried out with the financial, technical, human, material and organizational sources available. Therefore, feasibility and evaluation function as the interface between conception and reality. They link the planning set of project tasks (identification, formulation, preliminary design) with the action oriented set of tasks (selection and approval).

III. ESTABLISHING A PROJECT ANALYSIS FRAMEWORK

Projects have life cycle characteristics, and independent of its duration or type, every project follows the phases of project conception, opportunity study, prefeasibility study, feasibility study, investment and operating phases and finally post-project evaluation. (Sell, 1991)

Project concept arises over time. There must be some people to initiate the project. This initiation process may result from the discussions of the persons having several functions within the firm, enterprise or the government. There can be an opportunity to be exploited and if the existing resources and the experience are sufficient to deploy this opportunity, then it is worth collecting technical, market and financial information (Culpin, 1989).

When the project concept is worth examining, the opportunity and pre-feasibility studies simply check whether the project is technically and/or economically feasible. If the result of these analyses are positive, then a more complicated feasibility study is done. This phase is only a rough check and can be performed just in the minds of the people. The aim is to quickly sift those projects which have a low probability of success. In this way, the costs which would occur in a more expensive feasibility study are avoided.

If the opportunity and prefeasibility checks are positive then feasibility study is performed. Generally, the feasibility study can be divided into three categories: a techno-economic analysis, a financial analysis and an economic analysis. The techno-economic analysis deals with the technical details of the equipment and plant together with the production and sales and supplier markets. Financial analysis is done to examine financial dependability of the project and economic analysis deals with the effects of the project on the economy (Sell, 1991).

Final presentation of the project evaluation is usually in the sequence described above.

The financial and the economic analyses are not only limited to determination of the financial planning and a consequent valuation based on a given technical and market analysis. The result can also require a re-formulation of the project as well as a modified technical approach.

If the result is positive, that is the project is accepted, then the phases of investment and operation start.

Figure 1 depicts the project analysis framework proposed in this study.

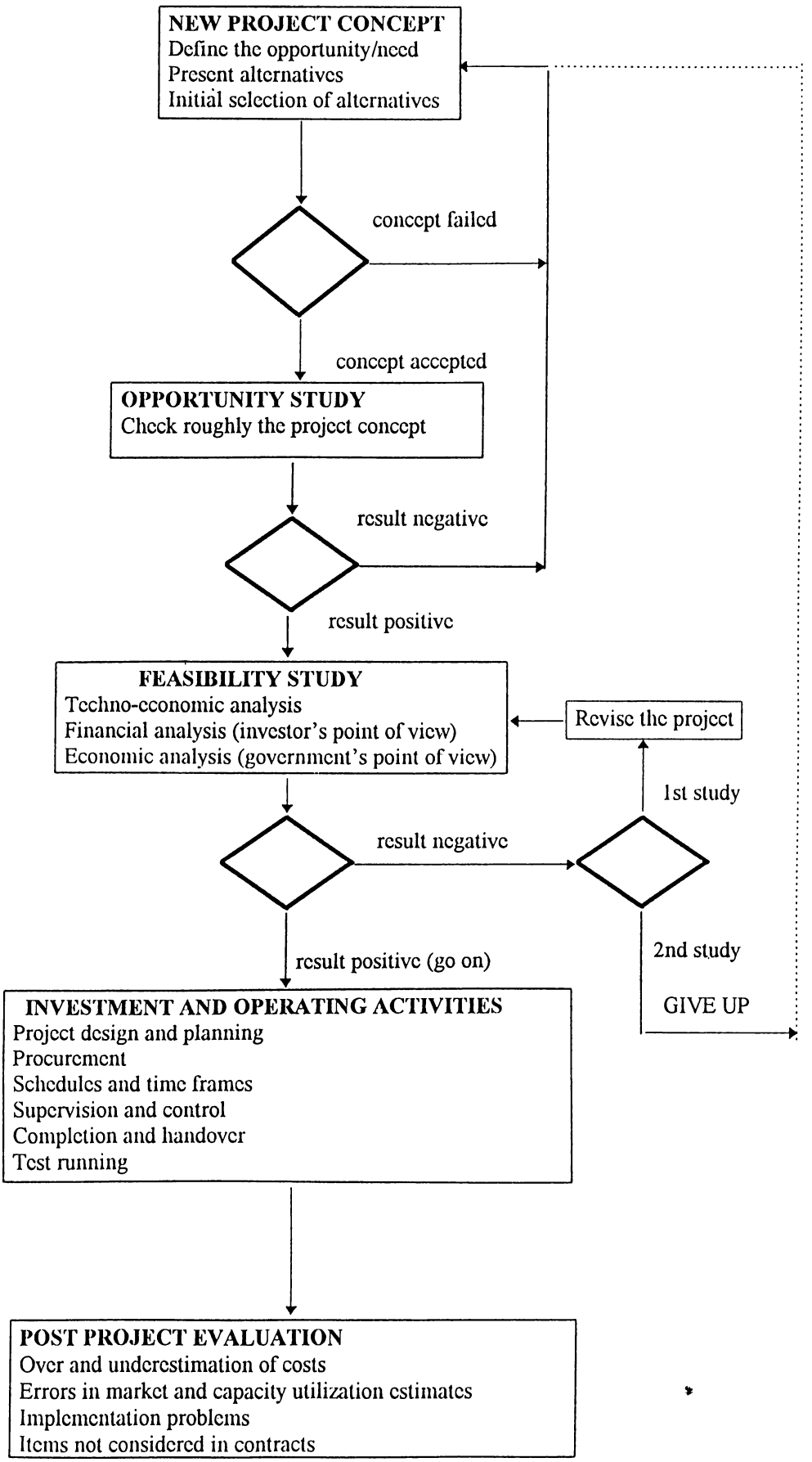

Figure 1 : Project Analysis Framework

III.1. THE PROJECT CONCEPT

Idea of a project occurs at the very beginning of project life cycle. Project conception usually arises when a necessity or requirement or an opportunity, that is in conjunction with the firm's missions or areas of interest, is seized.

An enterprise which already exists may be planning the expansion of its economic activity in particular fields. Other economic units may be interested in starting up new activities. Furthermore, fundamental necessities of a country can give important clues about the needs to be satisfied, hence the concept of several projects. In developing countries, on the other hand, governments and related institutions like central planning agencies have been the main identifiers of projects. Private enterprises or corporations also develop projects to fulfill the conditions determined by governments (Goodman, 1988).

Finding out the idea of a new project is a creative act and it should be supported by means of systematic searches. Developing countries can analyze the development path of industrialized countries to get some clues of the chances in the market place. Another possible field maybe fulfilling the demand for intermediate products formerly imported (Sell, 1991).

Characteristics of the project analysis and approval methods of the company determines the level of complexity of the project conceptualization. In this study, steps of project conception is outlined below:

- Describe the requirement or opportunity which is in parallel with the strategy of the company,
- Present alternatives,
- Select among the alternatives (initial selection).

III.2. OPPORTUNITY CHECK

Once a project idea is being considered more seriously, then opportunity check is done. This very rough study is performed to make clear the possibilities of technically realizing the project in the region. Furthermore, first signals of the chances of the project to be an economic success is monitored.

III.3. FEASIBILITY STUDY

Feasibility study deals with the techno-economic, financial and economic analyses of the investment project and according to the result of this study investment decision is made or not. The feasibility study outline used in this study is given in Figure 2.

III.3.1. Techno-Economic Analysis

Techno-economic analysis deals with the *technical feasibility* of the project. When doing this, sales and supply markets and material needs are to be taken into account. Material needs are closely linked with the technology employed and the location of the

project. When conducting a techno-economic analysis, the items that should be considered are market analysis and project technology.

III.3.1.1. Market Analysis

In market analysis both sales and supplier markets need to be examined. First step of this examination is to calculate current demand and the suppliers serving the market presently. Here, doing a market segmentation analysis may help to capture the opportunities in some segments. Then, competitive situation should be investigated. When doing a competitive analysis, it is helpful to consider the cost/price relations and profit margin of the market. After that, future projections on the focused segment of the market is to be done.

In summary, market analysis should include information about the following items:

- current and future demand markets,
- current and future supply markets,
- market growth rates,
- marketing objectives and strategies.

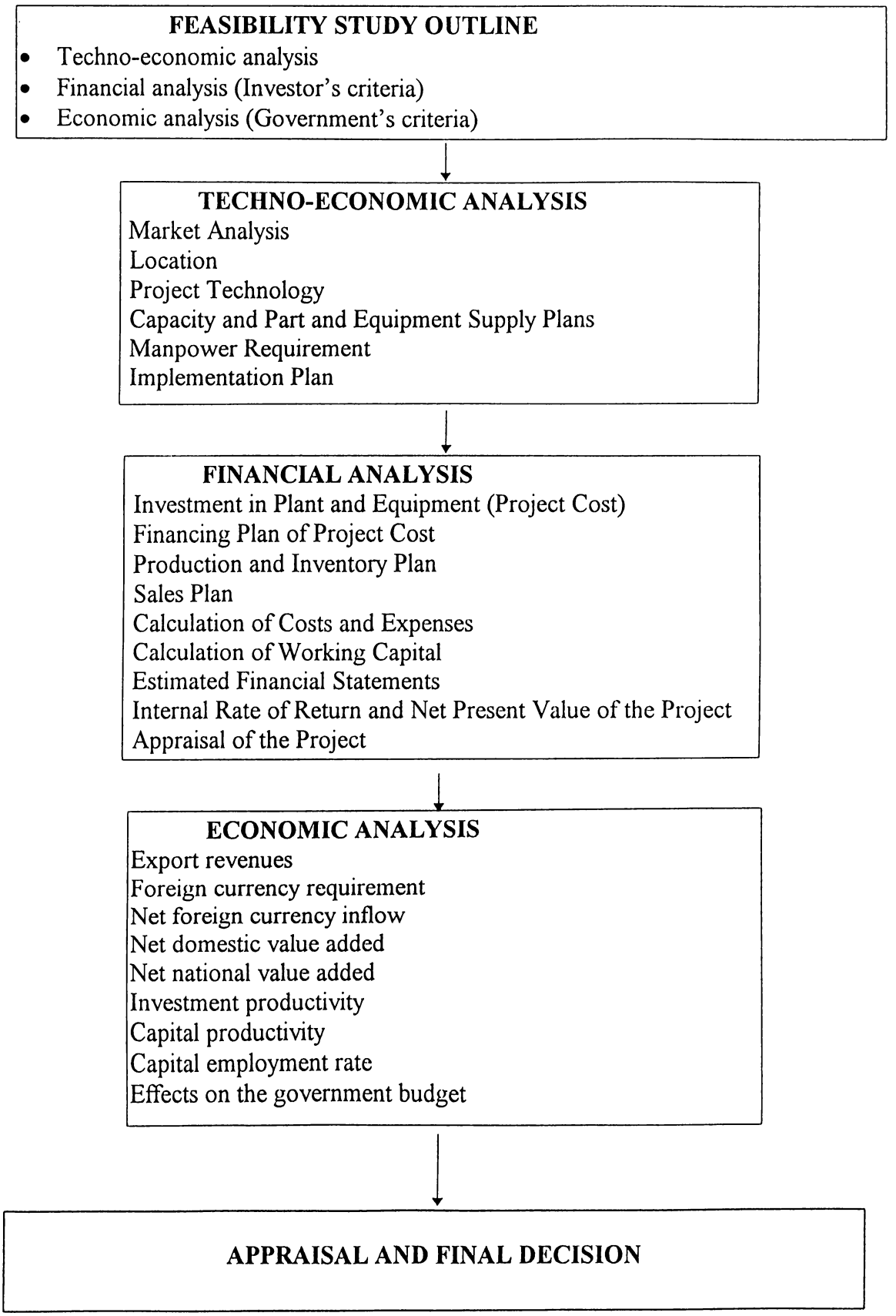

Figure 2: Feasibility Study Outline

III.3.1.2. Project Technology

In this section the technologic aspects of the project are to be investigated. When doing this, the points that should be considered are:

- plant description (technology and process description),
- utility requirements,
- product specification and production capacity,
- equipment and part supply plans,
- location,
- implementation plan,
- required manpower.

III.3.2. Financial Analysis

Financial analysis is the core of project evaluation. The opportunities seen after market analysis and availability of technology to fulfill that opportunity are closely related with the options and obstructions of the financial aspects. Financial analysis first determines how much capital is required to complete the project. This analysis focuses on whether the project can sustain its financial obligations, have adequate working capital, and generate enough funds to guarantee sufficient cash flow so that the project is kept operational (Goodman, 1988). Steps of financial analysis are given below.

- calculation of project cost,

- financing plan,
- production, inventory and sales plans,
- earnings,
- expenses,
- working capital,
- cost of goods sold,
- estimation of financial statements (income statement, cash flow statement and balance sheet),
- appraisal criteria (net present value, internal rate of return and payback period).

III.3.2.1. Project Cost

Total fixed investment to establish the project plus the first year's working capital gives the project cost. This cost includes acquisition of land, purchasing of machinery and equipment, construction of building, purchasing of vehicles and office facilities, interests during construction, importation of customs costs, royalty and know-how payments and pre-operation expenses.

III.3.2.2. Financing Plan

Project financing helps entrepreneurs to lower their investment and operating risks. Financing plan should reveal the credit support necessary to implement the investment project (Gremp and Higgins, 1989). The plan consists of two portions: equity and debt. Equity capital of the entrepreneurs is one of the main sources of finance. Other

important source is the amount of debt to be borrowed from creditors. Financing plan gives the debt-equity amounts and the repayment schedule of the loan at a certain interest rate.

III.3.2.3. Production, Sales and Inventory Plans

Sales plan is derived from sales assumptions of market analysis and the estimated sales prices. According to sales assumptions and inventory amounts the production plan is prepared. Usually, the production amount for a particular period is the estimated sales amount plus the finished goods inventory of that period.

III.3.2.4. Earnings

Result of the operations of an enterprise is called ***performance*** and it is related to the goods and services produced. Therefore, the items that determine the performance of the project are:

- products sold (turnover),
- finished goods inventory,
- work in process inventory,
- machinery and equipment produced by the facility,

No non-business activities have been planned in the project. This means that, the items above are generally related with the earnings of the project. Other than operating

revenues of the project, sale of machinery and equipment above the book value can also be sources of earnings.

III.3.2.5. Expenses

Expenses are examined in three categories. These are:

- Direct Expenses,
- Depreciation Expenses,
- Selling, General and Administrative Expenses.

Direct expenses arise from electricity power utilization, consumable tools, repairs and maintenance, factory supplies, traveling cost, welfare, insurance, vehicle maintenance cost, communication cost, royalty payments and others.

Important forms of payments connected with the fixed assets are acquisition of land, construction of facility, purchasing of machines, equipment and vehicles and office facilities and purchase of patents and licenses. These assets, except the land, are depreciated over a period of time resulting in depreciation expenses.

Selling, general and administrative expenses are the cost that are not directly related with the production of goods and services. These are sales administration costs, indirect labor cost, promotion and advertising cost and the costs pertained to similar activities.

III.3.2.6. Working Capital

In order to run a project, acquisition of land, machines and other facilities are not sufficient. In addition to these, it is necessary to have stocks of raw materials, supplies and also cash so that any interference that can distort the running of the facility is avoided. Accumulation of such stocks is pertained to the payments. Current assets indirectly lead to costs and expenses since financial funds are tied up in them and the resulting interest has to be included as costs or expenses in accounts. Therefore, these type of expenditures and costs constitute the working capital or the current operating capital. Many investment decisions can be distorted by underestimation of working capital needs (Hill, 1989). To run the facility working capital is necessary because :

- It helps to avoid higher costs under unpredicted circumstances such as unpredicted obligations, unexpected delays in obtaining raw materials and repairs.
- It can be used to stimulate sales by granting credit to the customers.
- It finances the work in progress.

Items of working capital are :

- raw materials and supplies,
- spare parts,
- finished and semi-finished goods,
- accounts receivable,
- cash

Financial funds necessary for the working capital are the opposite of the trade credit granted by suppliers. Hence, net working capital is the difference between currents assets and current liabilities.

III.3.2.7. Cost of Goods Sold

Summation of costs related directly with the production of goods and services give cost of goods sold. Items of direct production costs can be put into three categories:

- material cost,
- direct expenses,
- direct labor cost.

III.3.2.8. Estimation of Financial Statements

Data collected so far should be used to estimate net income, balance sheet and future cash flows of the project. These estimations roughly sketches the future path of the project and they allow the calculations of project appraisal criteria.

III.2.2.9. Appraisal Criteria

Analysis of net cash inflows and outflows during planned life time of the project allows us to calculate the viability of the project. Some of the most commonly used criteria of investment appraisal are net present value, internal rate of return and payback period.

If the results of calculation of these items are in line with the expectations of the investor then the project is said to be viable.

Net present value of the project is defined as the value which is obtained by discounting all periodic net cash flows (surpluses or deficits) at a predetermined rate of interest up to a point of time directly before the beginning of the investment. This rate is called implicit rate of return of the project. In the case of projects financed completely by loans the borrowing rate for funds is taken as discount rate. For equity financed projects return on equity may be used. In this study, the borrowing interest rate is simply used as the discount rate. A negative present value indicates that the project is not viable. If the net present value is positive, then it is more favorable to invest in the project than to deposit the funds elsewhere at the implicit rate of interest. The greater the net present value, the more the project is viable (Sotelino and Gustafson, 1989).

Internal rate of return of a project is defined as that discount rate which makes the net present value zero. The reference standard for appraising the internal rate of return is the implicit rate of return used in net present value calculation. In order for a project to be viable with this method, internal rate of return should be greater than implicit rate of return (Brealey, 1991).

Pay-back method finds out the period in which the discounted accumulated cash inflows including the particular period are greater than the accumulated and discounted expenditures. It is in this period that outpayments amortize themselves. This method shows how quickly cash inflows compensate cash outflows. This method does not give

the economic profitability of a project (any cash surpluses which occur at a later date are not taken into account), rather it shows the risk involved in that particular project. The quicker the payback period is reached, the smaller the risk involved (Sell, 1991). Therefore, this method is not the substitute of net present value method, but complements it.

III.3.3. Economic Analysis

In financial analysis the important point is that *'how the investors' cash flows will be changed by the planned project'* (Sell, 1991). However, government considers the effects of the project on the whole economy. That is how the economic units such as enterprises, employees, and the consumers and the government are going to be influenced by the project. Therefore the points to be considered in economic analysis are as follows:

- Export revenues,
- Foreign currency requirement,
- Net foreign currency inflow,
- Net domestic value added,
- Net national value added,
- Investment productivity,
- Capital productivity,
- Capital employment rate,
- Effects on the government budget.

III.4. INVESTMENT AND OPERATING ACTIVITIES

Investment phase consists of the following activities.

- project design and planning,
- decisions about procurement of equipment, resources and manpower,
- schedules and time frames, supervision and control
- completion and handover.

III.5. POST PROJECT EVALUATION

After the project is completed, the final result can be examined and analyzed to see the deviations from estimated values. Post-project analysis may help to development banks, consultancy firms and state planning organizations to avoid typical mistakes in the estimations of other similar projects. A post-project analysis may investigate the following points:

- systematic over and/or underestimation of some types of costs,
- systematic errors about the estimations of market and capacity utilization,
- problems faced during implementation,
- items that are not considered in the contract with construction companies, consulting firms, and patent and license owners (Sell, 1991).

IV. A FEASIBILITY STUDY FOR A CONSUMER DURABLE BUSINESS

The study is done to see whether the investment on a totally new refrigerator facility is feasible or not. In this study the project analysis framework presented in Figure 1 and Figure 2 are used.

IV.1. PROJECT CONCEPTION

In order to explain the initiation of project concept, it is better to give the overall picture of the company that will make the investment. This will make clear the starting point of the idea of entering into refrigerator production industry. For this reason, the following sections give the company profile and company strategy.

IV.1.1. Company Profile

The potential investment is to be done by the company Vestel Household Appliances which is a member of Zorlu Holding. Among its holdings the Zorlu Holding company leads two major Turkish industrial groups; *Zorlu Textiles* group and the *Vestel Electronics and Household Appliances* group. Other holdings include companies in sectors such as energy, tourism and trading companies situated in Western Europe.

Zorlu Textiles Group is the world's largest producer of curtains in terms of both plant and production. In addition to this main product, the group also produces and/or markets many other related products such as table clothes and upholstery fabrics in textiles. The Zorlu Holding company employs 7200 people in production and marketing. Research and development activities in electronics group engage over 100 specialists and support staff, and result in products manufactured utilizing proprietary design and technology.

Vestel Electronics and Household Appliances Group consists of the following companies.

- Vestel Electronics Industry and Trade Inc. : Manufacture of color televisions
- Vestel Foreign Trade Inc. : Export marketing of color televisions.
- Vestel Durable Consumer Products Marketing Inc.: Domestic marketing of consumer electronics and household appliances.
- Veskom Computer Communication Trade Inc.: Domestic marketing of information technology products.
- Telkom Electronics Communication Devices Manufacturing and Trading Inc.: Manufacturing of electronic components and telecommunication products.

The milestones in Vestel Electronics and Household Appliances Group are:

1985 Established by the Pollypeck Group;

1985 Color TV Production Begins;

1987	Export of TV sets;
1987	Production of microwave oven;
1988	PC monitor production for IBM;
1988	High end digital TV production;
1989	Export of audio equipment;
1990	White goods production begins;
1991	Pollypeck Crisis;
1994	Economical Crisis in Turkey;
1995	Acquisition by Zorlu Group.

Vestel Elektronik A.Ş. was established in 1984 in Manisa for the purpose of manufacturing television sets and consumer electronics products (brown goods). Subsequently in 1986, the group vertically integrated through the acquisition of ***Telkom,*** a local producer of TV tuners and remote control units and in 1989 acquired a 30% interest in ***Pekel,*** the Merloni-Philco-Vestel joint venture company in Manisa manufacturing household appliances (consumer durables). The effects of the takeover by Zorlu Holding include increasing the production of television sets to 550,000 units in 1995 from 400,000 units in 1994. Target production for 1996 is 1,200,000 units and 2,000,000 units annually in medium term. Vestel Electronics produces televisions under its own technology and offers its products to European markets in accordance with European standards and manufacturing has been awarded the ISO 9001 quality certification. Televisions are sold in Turkish market under the Vestel brand name and are produced with different brand names for export. The production with different brand names for different markets is called ***Original Equipment Manufacturing*** (OEM). Hence, Vestel Elektronik is among the largest OEM companies of Europe in

television sets. In 1995 a new television production facility was started up in Romania, a market where Vestel has been very active. The company forecasts growing sales in its current export markets in the Middle East, North Africa, Eastern Europe, Turkish Republics and Western Europe. Currently, foreign sales are 54% of total sales of Vestel Electronics.

The marketing company ***Vestel Pazarlama A.Ş.***, was established together with the manufacturer Vestel Elektronik in 1984, in order to facilitate the distribution channels and sales of both white and brown goods within Turkey. This company presently has a nationwide distribution network of 3,000 independent sales points and 300 Vestel service centers. Similarly, ***Vestel Dış Ticaret A.Ş.*** (Vestel Foreign Trade Inc.) was formed in 1990 in Manisa in order to expedite export sales. The company's main field of activity is to provide sales and operations support for Vestel exports, specifically color TV's. Total quality concept and ISO 9001 standard, better pricing flexibility in lead times, technology, easy communication due to geographical proximity, less transportation costs and zero customs duty has allowed Vestel Foreign Trade Inc. to dramatically increase export sales to 70% of televisions produced.

The marketing company ***Veskom*** was established in 1987 to penetrate the domestic market for information technology equipment. Veskom imports and markets under the Vestel brand name personal computers and their accessories, facsimile equipment, bar code equipment and PC components. Integrating a strong regional sales force along with high profile sales and marketing campaign Veskom is looking to capture 10% share in the marketplace.

Telkom A.Ş. produces TV tuners for Vestel and foreign markets. It also manufactures and supplies remote control units to Vestel and to TEMIC Telefunken. Recently, Telkom's production has expanded to include set top satellite receivers for TV broadcasts. Telkom's production facilities are located in a 'free trade zone port' where imports and exports are not subject to cumbersome and costly governmental regulations and certain tax advantages are granted. Telkom utilizes its own technology and markets under the Telkom brand name locally and produces on an OEM basis for exports.

In 1995 the Vestel Group was acquired by the Zorlu Holding company.

IV.1.2. Company Strategy and Project Concept

At the end of 1995, a strategic decision has been taken to sell Vestel's equity stake in ***Pekel.*** The Pekel operation consisted of assembly of laundry washing machines and manufacturing of refrigerators. Refrigerator production capacity was 250,000 units annually of which approximately 60% is exported.

Following its decision to divest its Pekel holdings, Vestel has arrived at a strategic crossroads. The strategy imposes that Vestel was to stay in the consumer durables market with a full product line.

Under this strategy the concept can be stated as: Vestel should offer the market consumer durables as well as brown goods in order to make dedicated dealers (dealers that sell only Vestel branded goods) and to increase the sales and market share. To

realize the concept, two alternatives had been emerged which are considered in the next section.

IV.1.3. Project Alternatives

Alternatives of staying in the consumer durables market are:

- Import consumer durables then market them locally under Vestel brand name.
- Establish a manufacturing plant to produce consumer durables.

IV.1.3.1. Import Only Alternative

This alternative states that Vestel is going to import refrigerators and other consumer durables on an OEM basis and market them under Vestel brand name.

IV.1.3.2. Establish a White Goods Manufacturing Plant

According to this alternative Vestel is going to construct a manufacturing plant and until start up of Vestel's own consumer durables plant, Vestel will import consumer durables on an OEM basis and market them locally under the Vestel brand name in order to remain active in this market. The decision of starting up of Vestel's own consumer durables plant is going to depend on the results of the **feasibility study.**

IV.1.3.3. Initial Selection Among Alternatives

Import only alternative is rejected because:

- This way the company is not going to be able to export consumer durables. Vestel has a very strong exporting expertise and exports play a crucial role in the company mission.

- There is a strong competition in domestic market and selling only in domestic market would not be so profitable.

Second alternative is accepted because it fulfills the mission and strategy of the company.

Now, Vestel is in the decision process of reinvesting in a new consumer durables manufacturing plant in Turkey.

IV.2. OPPORTUNITY CHECK

The mission of the business unit, from here on called 'Vestel Household Appliances' is going to be producing quality household appliances in a cost effective manner in order to become a leader in Turkish market and a major exporter to world markets. Product features and price shall conform to market needs.

Under this mission the strategy can briefly be stated as 'The company will start strong marketing activities in household appliances in 1996.' The flagship product will be no-frost type refrigerators. All products will be branded on an OEM basis. In this manner, sales and commercial operations for appliances will have secure roots prior to the beginning of manufacturing operations. According to the result of the feasibility study, a no-frost refrigerator production facility of 400,000 units annually may begin production in 1997. It is envisaged to be the first step of an intensive investment program for the production of appliances. Subsequent investments in washing machines and dish washers will complete the investment plan. Striving to maintain its leading role in the development of the market, the Vestel Production Plant aims to expand in a growing market by contributing the use of environment friendly manufacturing and refrigerant gases.

Since above definition of new plant is in conjunction with the Vestel's policy and mission it is worth doing a feasibility study on it.

IV.3. FEASIBILITY STUDY

In this case study, techno-economic and financial analyses are performed.

IV.3.1. Techno-Economic Analysis

Here, market conditions and project technology are analyzed interactively.

IV.3.1.1. Market Analysis

First step in techno-economic analysis is to analyze the market whether there is a potential area where the project would have a chance of success. The analysis investigates suppliers, demand, market shares, Vestel's strategy and effects of Customs Union.

Turkey's consumer's per capita income and standard of living is steadily increasing. Table 1 shows the major economic indicators of Turkey.

Table 1: Economic Indicators of Turkey

	1993	1994	1995	1996*	1997	1998
Population (million)	59,869	61,183	62,526	63,898	65,300	66,733
Population Growth (%)	2.2	2.2	2.2	2.2	2.2	2.2
Households (million)	12,224	12,591	12,968	13,279	13,598	13,934
GNP (US$ million)	108,387	103,300	105,800	112,000	115,500	122,000
GNP Growth (%)	7.3	-5	2	6	3	5

Source: Turkish Statistical Yearbook, State Statistics Institute, Ankara, 1995
*: The values for 1996 and afterwards are forecasts.

Starting from 1996, Turkey entered into Customs Union with the European Union (EU) meaning that all import duties and taxes between EU countries and Turkey are to be eliminated. Therefore, European appliances, at competitive prices, will soon become available in the Turkish market. Since local manufacturers have enjoyed a protected market for many years, their product features are inferior when compared to import

models and local suppliers will be at a disadvantage unless they upgrade features. Consumers with increasing purchasing power will prefer imports, especially the upper end of the market. Overall, appliances will upgrade with improved features, this is especially evident in the market's shift to no-frost and larger size model refrigerators.

Vestel has proven a track record in appliances. For many years Vestel imported household appliances on an OEM basis and marketed them under the 'Vestel' brand. The 'Vestel' brand is well recognized by the Turkish public in household appliances, especially refrigerators. In 1993, Vestel sold 40,000 refrigerators in the domestic market. In 1994, due to financial difficulties, Vestel stopped branding OEM appliances.

IV.3.1.1.1. Suppliers

Currently, the companies in Turkish refrigerator industry are Arçelik, PEG and Merloni (Pekel) and since 1991 their total capacities have been 2,000,000 units per year and no capacity increase is expected for these three producers till the year 2000. On the other hand, starting from 1997 Vestel is probably (depending on the result of the feasibility analysis) going to produce 200,000 refrigerator units per year. In the year 2000 Vestel will increase the capacity to 400,000 units.

Actual refrigerator production have been increasing and since 1991 with an average increase of 7% it reached to 1,265,000 in 1994. Despite the decrease in domestic sales in 1994, due to the increased exports the capacity utilization rate has increased to 63%.

Import amounts changed in correlation with the currency rate. It has increased by 153% in 1993, whereas there was a 48% decrease in 1994. In 1993, 12% of domestic demand was met by imports and this rate has dropped to 7% in 1994. Import unit prices are nearly 3 times the export unit prices. Therefore the imported refrigerator models are high technology (no-frost) and big models.

Table 2 gives refrigerator import values with ex-factory prices. In 1994, the countries from which Turkey imports refrigerators are: South Korea (78%), Greece (12%), USA (3%), Germany (2%) and Italy (2%). The share European Union countries is only 18% of total imports.

Table 2: Turkey's Refrigerator Imports

Description	1991	1992	1993	1994	1995
Units	35,282	43,223	109,275	56,767	46,048
Total Amount (1,000 USD)	11,881	18,996	48,392	24,987	15,533
US$/Unit	337	439	443	440	424

Source: Beyaz Eşya Sanayicileri Derneği

IV.3.1.1.2. Demand

Domestic demand for refrigerators had been around 810,000-850,000 annually between the years 1991-1993. Due to the economic crisis in 1994, the demand decreased by 14% and dropped to 730,000. In 1995, however, domestic sales has increased by 10%.

On the other hand, exports had increased by 68% in 1993 and 25% in 1994 and 36% in 1995. Table 3 gives the export values and unit ex-factory prices.

The share of European Union countries in Turkish refrigerator exports have been 54% in 1991, 60% in 1992, 44% in 1993, 61% in 1994 and 52% in 1995. Up to now, Turkey exports refrigerators to 82 different countries.

Table 3: Turkey's Refrigerator Exports

	1991	1992	1993	1994	1995
Units	164,613	278,692	469,418	585,973	795,584
Total Amount (1,000 USD)	28,598	50,049	65,768	85,289	127,367
US$/Unit	174	180	140	146	160

Source: Beyaz Eşya Sanayicileri Derneği

In summary, Table 4 gives the overall demand-supply structure of Turkey's refrigerator industry. In 1996, the production is expected to increase by 10%. Hence capacity utilization rate is going to be 90%. Exports are projected to increase by 14%. By this way exports/production rate will be 56%.

IV.3.1.1.3. Market Shares and No-Frost Case

This section highlights Vestel's manufacturing strategy. There are mainly 6 brand names in the market. These are Arçelik, Beko, Profilo, AEG, Merloni and Vestel. Market shares for refrigerators are given in Table 5.

Table 4: Demand-Supply Structure of Turkish Refrigerator Industry

						Percentage Change		
Years	**1991**	**1992**	**1993**	**1994**	**1995**	**93/92**	**94/93**	**95/94**
Capacity (1,000 units)	2,000	2,000	2,000	2,000	2,000	0	0	0
Production (1,000 units)	1,027	1,087	1,247	1,265	1,650	15	1	30
Capacity Utilization Rate (%)	51	54	62	63	83	+8	+1	+32
Domestic Sales (1,000 units)	861	809	844	729	816	4	-14	12
Imports	35	43	109	57	46	153	-48	-23
Exports	165	279	469	586	796	68	25	36
Domestic Consumption	897	852	887	786	862	4	-11	10
Total Demand	1,061	1,131	1,356	1,372	1,658	20	1	21
Imports/Domestic Consumption (%)	4	5	12	7	5	+7	-5	-2
Exports/Production (%)	16	26	38	46	48	+12	+8	2

Source: Beyaz Eşya Sanayicileri Derneği

Table 5: Refrigerator Market Shares (%)

	1993	1994	1995	1996	1997
ARÇELİK	37	37	37	32	28
BEKO	18	17	18	15	13
PROFİLO	22	25	24	25	24
AEG	14	16	15	14	11
MERLONI	0	0	3	4	5
VESTEL	8	4	0.5	7	14
OTHER	1	1	2.5	3	5
TOTAL	100	100	100	100	100

Source: Vestel Marketing Department

Currently domestic producers are not so successful in producing no-frost type refrigerators and the demand for no-frost refrigerators is mostly supplied by imports. There is an increasing demand for no-frost refrigerators in Turkish market. Table 6 gives the breakdown of actual and estimated values of direct cooling (static) and no-frost type refrigerator demand in Turkish market.

Table 6: Static and No Frost Breakdown of Turkish Refrigerator Market

(1,000 units)

	1993	1994	1995	1996	1997	1998
Static	800	700	700	630	630	660
No-frost	87	86	170	270	340	390

Source: Vestel Marketing Department

* : The values for the year 1996 and afterwards are estimations

Given the situation above, Vestel is going to focus on no-frost type refrigerators, hence it is more meaningful to look at the company's share in no-frost market. Table 7 gives Vestel's targeted share in no-frost market.

Table 7: Vestel's No-Frost Domestic Market Share (Estimations)

	1996*	1997	1998	1999	2000
No-frost market (units)	270,000	340,000	390,000	600,000	725,000
Vestel's total sales (units)	60,000	110,000	165,000	240,000	290,000
Vestel's market share (%)	22	32	40	40	40

*: In 1996, the models are going to be imported to enter into the market

Vestel's export projections are given in Table 8.

Table 8: Vestel's Export Projections

1999	2000	2001	2002	2003
65,000	97,500	100,000	100.000	100.000

IV.3.1.1.4. Effects of Customs Union

Turkey is a net exporter of refrigerators to European Union countries and the domestic demand is mainly met by domestic production. The import duties were about 23% of CIF price before customs union. Table 9 shows the customs and duties for refrigerator imports for refrigerators.

Table 9: Custom Taxes and Funds for Refrigerator Imports

	European Union and EFTA	**Other**	
	Custom Tax (%)	Custom Tax (%)	Fund ($/unit)
Volume Less Than 340 lt.	3	9.1	21
Volume Greater Than 340 lt.	3	8.4	27

In the medium term, if foreign producers can establish a good dealer and service network, this is going to be an advantage for foreign companies. However, establishing such a network is only possible through strategic partnerships with domestic firms. Hence, if Vestel forms such a strategic partnership with a foreign producer, the company will positively be affected by customs union.

IV.3.1.2. Project Technology

Data about project technology is obtained from parts and equipment suppliers. This section starts with the plant description. Plant description includes process flow diagram and plant layout. Figure 3 represents the process flow diagram of the project. Explanations of product specifications and production capacity follow the plant description. Utility requirements of the plant is depicted in Appendix A.1.

V.3.1.2.1. Plant Description

Layout of the plant is given in Figure 4. The plant is designed to produce three models of no-frost refrigerator, and also is considered to minimize additional investment when it is planned to invest additional model in the future. The plant is going to use pre-coated metal (PCM) as the raw material for the steel sheet of cabinet, which is an advanced manufacturing method. Since this method does not require another painting equipment, it has many advantages, especially saving of investment cost and less workers required.

Also, in order to maximize the localization portion of production parts in Turkey, this plant shall have some kinds of parts processing lines which are EPS foaming line, gasket and ABS sheet extrusion line, pipe and evaporator processing line and so on.

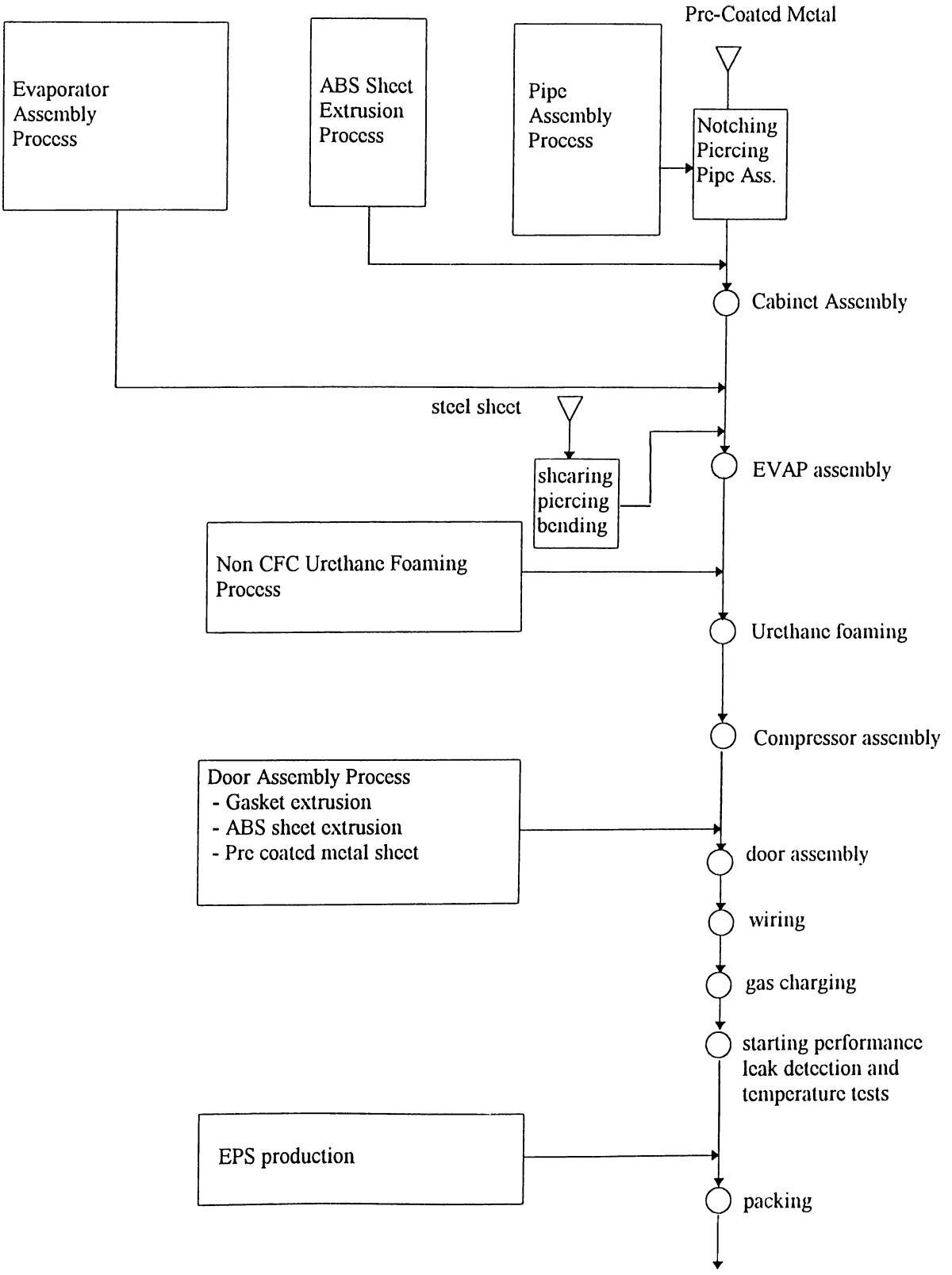

Figure 3 : Process Flow Diagram of The Plant

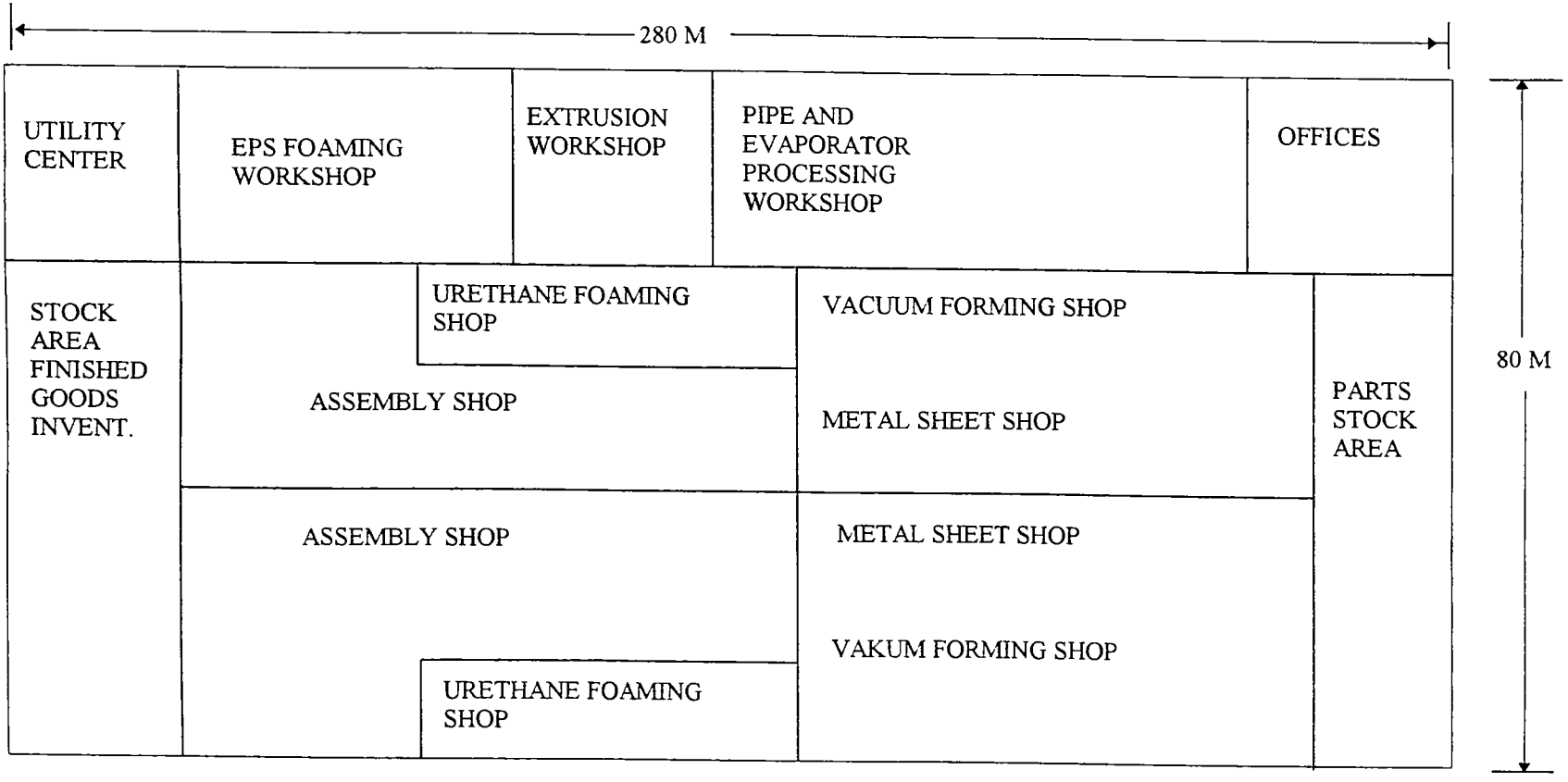

Figure 4 : Plant Layout

(Not Drawn Into Scale)

IV.3.1.2.2. Product Specification

Three refrigerator models to be produced in the plant shall be 'No-Frost Cooling system with Electronic Control' type. The specification of the products are given in Appendix A.2. The features are determined after a market survey conducted by the marketing department. People with technical background were also involved in the determination process.

IV.3.1.2.3. Production Capacity and Part and Equipment Supply Plans

The plant will have an annual production capacity of 200,000 sets of refrigerator based on 250 effective working days per year and 8 working hours per day.

Equipment Supply Plan:

Most part of the main machinery and equipment of the plant is going to be imported. Appendix A.3. gives the equipment supply plan of the plant. The surface treatment system for evaporator processing is to be done by a local sub-contractor. For injection molding parts, injection molding dies for the large parts are going to be imported, but for small parts it is going to be produced by sub-contracting.

Parts (Materials) Supply Plan:

Appendix A.4. gives the parts supply plan. The aim of preparing such a plan was to investigate the parts which can locally be subcontracted. Furthermore, foreign and domestic prices of the parts and material used in production have been calculated by

utilizing the results of this survey. Material prices are used in financial analysis part. The plan had been prepared after a 3 weeks survey of Turkish subcontracting industry.

IV.3.1.3. Location (Site Information)

Location of the project is Manisa Industrial Park. The description for job site is given below.

Sea-Port (Available and Nearest)

İzmir Seaport is 40 km away from the site. Transportation from port to site can be done thorough containers and trucks.

Air-Port (Available and Nearest)

The site is 60 km to the İzmir Adnan Menderes Airport.

Residential Area

The site distance to İzmir is 30 km and to Manisa is 5 km.

Condition of Vehicular Road to Job Site

The vehicular road is asphalt and single lane.

Trucking Capacity and Cost From Seaport

Containers and bulk transportation are available from seaport to the site. The cost for 20 Ft container is $25 and 40 Ft container is $50. Bulk transportation costs $20.

IV.3.1.4. Implementation Schedule

Implementation plan of the project is given in Figure 5. Orders of machinery and equipment and construction of building and utility works are going to be given at the same time. Suppliers of machinery and equipment propose six month lead time. At the end of sixth month both the manufacturing and equipment and the building and utility works are going to be finished. Transportation of machinery to the site will take two months. During this time the workers are going to be trained. Starting with the ninth month, installation of equipment and trial runs will be performed. This will take additional three months. As a result, one year after the start up, the mass production is going to start.

DESCRIPTION	MONTH												
	M+1	M+2	M+3	M+4	M+5	M+6	M+7	M+8	M+9	M+10	M+11	M+12	M+13
1. START UP													
2. MANUFACTURING OF EQUIPMENT													
3. BUILDING AND UTILITY WORK													
4. TRANSPORTATION													
5. INSTALLATION OF EQUIPMENT AND TRIAL RUN													
6. MASS PRODUCTION													
7. TRAINING													

Figure 5. : Implementation Schedule

IV.3.1.5. Required Manpower

Manpower requirements of the plant is outlined in Table 10.

Table 10: Manpower Requirements

TITLE	Y+1	Y+2	Y+3	Y+4	Y+5 to Y+10
GENERAL MANAGER	1	1	1	1	1
ASSISTANT G.M.	1	1	1	1	1
ENGINEER	3	3	4	4	4
MANAGER	4	4	8	8	8
FOREMAN	20	20	40	40	40
OFFICER	10	10	20	20	20
PRODUCTION WORKER	262	395	528	790	790
(DIRECT)	292	425	588	850	850
(INDIRECT)	9	9	14	14	14
TOTAL	**301**	**434**	**602**	**864**	**864**

The site will be 30 kms away from İzmir. Being one of the largest cities of Turkey and with abundance of recreational activities, people would like to live in İzmir. Therefore, it is going to be possible to find qualified workforce

IV.3.2. Financial Analysis

In this part, first total investment required to establish the plant is calculated. Then, financing plan of the project is given. After that, production, inventory and sales plans are outlined. The next step is the calculation of expenses. Those figures result in the calculation of working capital. Following the working capital calculation, income statement, cash flow statement and balance sheets are estimated. The final part of the

financial analysis is the derivations of discounted cash flows, net present value and internal rate of return.

IV.3.2.1 Investment in Plant and Equipment (Project Cost)

When calculating project cost the following items are considered:

- Land,
- Building, Landscaping and Roads,
- Main Machinery and Equipment,
- Auxiliary Machinery and Equipment,
- Import and Customs Costs
- Custom Tax and Official Charges,
- Vehicles and Office Facilities Cost,
- Pre-Operation Expenses,
- Interest During Construction,
- Technical Data Document Package Fee,
- Supervision Fee,
- Working Capital of First Year.

Details of the calculation of project cost are explained below.

Land

The company is going to acquire the land in Manisa Organized Industrial Park. The cost of land is 1,080,000 US dollars.

TOTAL: 1,080,000 USD

Building, Landscaping and Roads

Breakdown of cost of building, landscaping and roads is given in Table 11. These costs are obtained after negotiations with several construction companies.

Table 11: Cost of Building, Landscaping and Roads

Description	**Amount**	**Unit Price (USD)**	**Total Price (USD)**
Roof Truss L=20.00m	160 Units	975	156,000
Purling Beam L=7.5m	1,480 Units	60	88,800
Gutter Beam L=7.5m	185 Units	150	27,750
Side Columns H=6m	80 Units	300	24,000
Center Columns H=6m	120 Units	300	36,000
Wall and Roof Covering	22,000 m^2	50/m^2	1,100,000
Floor Covering	22,000 m^2	30/m^2	660,000
Parking Place Roads Rain Pipes Landscaping			507,450
TOTAL			**2,600,000**

Main Factory Cost of Machinery and Equipment

Table 12 gives the breakdown of cost of main machinery and equipment. These costs have been deducted after negotiating with parts and equipment suppliers. Determinant of machinery and equipment list is the South Korean company that owns the technology.

Table 12: Cost of Main Machinery and Equipment

DESCRIPTION	USD (FOB)
Sheet Metal Shop	5,708,055
Vacuum Forming Shop	2,956,232
Urethane Foaming Shop	7,821,847
Assembly Shop	2,738,363
EPS Foaming Shop	3,218,136
Extrusion Shop	2,459,421
Parts Processing Shop	1,242,123
Testing Instrument	857,054
Mold and Dies	6,135,813
Maintenance Shop	404,875
Forklifts (3 units)	134,791
TOTAL	**33,678,144**

Auxiliary Machinery and Equipment

The prices of auxiliary machinery and equipment are listed in Table 13.

Table 13: Cost of Auxiliary Machinery and Equipment

DESCRIPTION	PRICE (USD)
Steam Boiler, 10 ton/st, 15 atu	179,200
Transformers (5 units)	127,500
Generator	228,850
Steam/Water Pipelines and Valves	300,000
Electricity Distribution System	200,000
Waste Water Treatment System	100,000
TOTAL	**1,135,550**

Import and Customs Costs

Main machinery and equipment of the plant is going to be imported. Therefore, there will be importation costs and customs taxes. First step in calculating import and customs costs is evaluating the CIF price, that is cost after freight and insurance. CIF price is found by the formula below. Therefore CIF price is found by adding the costs of freight and insurance to the FOB price.

Table 14 summarizes import and customs costs.

Vehicles and Office Facilities

Vehicles and office facilities are going to cost around 293,000 USD.

TOTAL: 293,000 USD

Table 14: Calculation of Import and Custom Costs

DESCRIPTION	AMOUNT (USD)
Cost of Freight and Insurance	1,346,125 (FOB x 0.04)
Bank Commission	168,000 (FOB x 0.5)
Bank Expenses	168,000 (FOB x 0.5)
Customs Commission	87,500 (CIF x 0.0025 %)
Customs Expenses	168,000 (FOB x 0.5)
Custom Tax	2,200,000
Custom Charges	40,000 (FOB x 0.12)
TOTAL	**4,177,625**

Pre-Operation Expenses

Pre-operation expenses is going to be about 1.5% of the cost of machinery and equipment. Therefore, it is around 600,000 USD. This information is obtained from the suppliers of machinery and equipment.

TOTAL: 600,000 USD.

Interest During Construction

When first year's working capital and equity is deducted from project cost (without interest payment) the first year's debt is found. This corresponds approximately to 30 million US Dollars. Therefore, construction term interest payment comes out to be 2.5 million USD on 8.5% rate.

TOTAL: 2,500,000 USD

Technical Data Document Package Fee

The suppliers of machinery and equipment charges 450,000 USD for technical data documents.

TOTAL: 450,000 USD

Training Fee

South Korean Company charges 210,000 USD for the training of plant employees.

TOTAL: 210,000 USD

Working Capital

Working capital for the first year is calculated in financial evaluation.

TOTAL: 8,613,403 USD

As a result, project cost turns out to be **56,068,722 USD.** Calculation of project cost in tabular form is given in Appendix B.

IV.3.2.2. Financing Plan

The investor (Zorlu Holding) will put 15 million USD on the project. Thus, rest of the money is going to be borrowed as long term debt from an international financing institution with the following terms :

Interest Rate (%)	8.5
Grace Period (Year)	2
Redemption Period (Year)	3

These figures resulted in the financing schedule given in Table 15.

Table 15: Financing Schedule

DESCRIPTION	YEAR	Y-1 1996	Y+1 1997	Y+2 1998	TOTAL
EQUITY	Current Year	15,000	0	0	15,000
	Cumulative Total	15,000	15,000	15,000	
LOAN	Cumulative Total	41,069	0	0	41,069
TOTAL		56,069	0	0	56,069

(Unit: US$ 1,000)

According to the schedule above the loan repayment plan is prepared in Table 16. Interest repayments are going to start from the first year. Principal repayments will be done beginning from third year.

Table 16: Loan Repayment Plan

DESCRIPTION	Y-1	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8
PRINCIPAL	41,069	41,069	41,069	32,855	24,641	16,427	8,214	0	0
REPAYMENT	0	0	0	8,214	8,214	8,214	8,214	8,214	0
INTEREST	0	3,491	3,491	3,491	2,793	2,095	1,396	698	0

(Unit: US$ 1,000)

IV.3.2.3. Sales, Production and Inventory Plans

Production and Material Plan

Production plan is prepared according to the sales estimations given in market analysis and the estimated inventory amounts. Sales amounts of the year plus the inventory

amounts of the same period gives the year's production amount. Table 17 outlines the production plan.

Table 17 : Production Plan

Production Quantity	Y+1	Y+2	Y+3	Y+4 to Y+10
FR-430				
Domestic	80,000	100,000	130,000	150,000
Export	0	0	30,000	40,000
FR-490				
Domestic	20,000	35,000	60,000	75,000
Export	0	0	20,000	30,000
FR-540				
Domestic	20,000	35,000	60,000	75,000
Export	0	0	20,000	30,000
Domestic Total	120,000	170,000	250,000	300,000
Export Total	0	0	70000	100000
GRAND TOTAL	120,000	170,000	320,000	400,000
Capacity	200,000	200,000	200,000	200,000
Productivity (%)	60%	85%	160%	200%

Following third year of operation two shifts will be done. Production amounts after the third year are going to be the same as the third year's amounts. This production plan results in the material plan which is shown in Appendix C.1.

Cost of material is broken into local and import parts. Ratio of imported materials to the total cost is 59%. Table 18 summarizes the material cost breakdown.

Table 18 : Material Cost

	UNIT COST		
MODEL	LOCAL	IMPORT	TOTAL
FR-430	127	167	294
FR-490	143	207	350
FR-540	148	220	368

Inventory Plan

Finished goods inventory is going to be 30 days for both export and domestic products. Inventory of local material for domestic products is 30 days, whereas it is 15 days for export products. On the other hand imported material inventory period will be 90 days for domestic goods and 45 days export goods. When estimating the inventory periods for local material, the periods of a similar facility were taken into account. Most of the import materials are going to come from Far-East. This explains why the inventory periods for imported matures are so long. Complete finished goods inventory quantities for the three models are given in Appendix C.2.

Sales Plan

Estimated domestic and export sales prices for the three refrigerator models are given in Table 19.

Table 19 : Sales Prices

SALES PRICES	US$/ UNIT
FR-430 DOMESTIC	512.7
FR-430 EXPORT	385.5
FR-490 DOMESTIC	542.1
FR-490 EXPORT	412.7
FR-540 DOMESTIC	589.6
FR-540 EXPORT	448.3

Sales quantity estimations are given in Appendix D. According to the sales prices for the models and estimations of sales quantities, sales revenues are calculated in Table 20.

Table 20: Sales Revenue

Sales (1,000 USD)	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6 to Y+10
FR-430						
Domestic	37,598	50,416	65,369	76,051	76,905	76,905
Export	-	-	10,601	15,099	15,420	15,420
FR-490						
Domestic	9,939	18,296	31,397	39,980	40,658	40,658
Export	-	-	7,566	12,037	12,381	12,381
FR-540						
Domestic	10,809	19,899	34,148	43,483	44,220	44,220
Export	-	-	8,219	13,075	13,449	13,449
Domestic Total	58,346	88,610	130,914	159,513	161,783	161,783
Export Total	0	0	26386.25	40211.25	41250	41250
GRAND TOTAL	**58,346**	**88,610**	**157,300**	**199,725**	**203,033**	**203,033**

IV.3.2.4. Expenses

Depreciation expenses have been calculated from the depreciation of building, machinery and equipment, mold, vehicle and office facilities. The straight line depreciation method is used. Depreciation periods considered in calculations are:

Building	20 years
Machinery and Equipment	7 years
Vehicles and Office Equipment	5 years
Amortization	5 years

Selling, general and administrative expenses are the expenditures realized from sales and promotional activities. Estimations of direct, depreciation, selling, general and administrative expenses and the assumptions used in the calculations are given in Appendix E.1., E.2. and E.3.

IV.3.2.5. Calculation of Working Capital

Net working capital is simply the current assets minus current liabilities. Current assets consist of accounts receivable, inventory of goods, inventory of material and cash. Accounts payable is taken as the current liability. Cumulative working capital is found by subtracting each year's current liabilities from the same year's current assets. Net working capital is the difference between current and previous years' working capitals. Appendix F shows the calculation of both net and cumulative working capitals

IV.3.2.6. Calculation of Cost of Goods Sold

Cost of goods sold or manufacturing cost is found by summing up material cost, direct labor cost and direct expenses. Direct labor cost is derived from manpower requirements. Table 21 shows the breakdown of labor cost.

Table 21: Calculation of Labor Cost

TITLE	WAGE $/MONTH	Y+1	Y+2	Y+3	Y+4	Y+5 to Y+10
GENERAL MANAGER	5,000	60	60	60	60	60
ASSISTANT OF G.M.	4,000	48	48	48	48	48
ENGINEER	3,585	129	129	172	172	172
MANAGER	2,988	143	143	287	287	287
FOREMAN	825	198	198	396	396	396
OFFICER	478	57	57	115	115	115
PRODUCTION WORKER	502	1,578	2,379	3,710	5,551	5,948
(DIRECT)		1,834	2,635	4,220	6,062	6,459
(INDIRECT)		380	380	567	567	567
TOTAL		**2,214**	**3,015**	**4,787**	**6,629**	**7,026**
					(UNIT: US$ 1,000)	

Using Table 16, Table 19 and Appendix E.1, cost of goods sold is calculated in Table 22.

Table 22: Calculation of Cost of Goods Sold

(1,000 USD)

DESCRIPTION	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6 to Y+10
MATERIAL COST	34,718	53,132	100,295	128,988	131,219	131,219
LABOR COST (DIRECT)	1,834	2,635	4,220	6,062	6,459	6,459
DIRECT EXPENSES	3,178	4,281	6,318	7,681	7,758	4,315
COST OF GOODS SOLD	**39,730**	**60,048**	**110,832**	**142,731**	**145,435**	**141,992**

IV.3.2.7. Estimated Financial Statements

All of the calculations done up to now result in the estimated income statement, cash flow statement and balance sheet are given in Appendix G.

Income Statement

Net income is found by subtracting sum of cost of goods sold, expenses and income tax from sales revenue. For the first three years the plant is not going to pay any income tax because Vestel has an investment incentive certificate for the project. The estimated net income is given in Table 23.

Table 23: Estimated Net Income (1,000 USD)

Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8 to Y+10
2,677	10,958	24,881	20,938	21,633	25,311	25,742	29,285

After the third year the project has a substantial amount of net income around 25 million US dollars. This makes the project attractive at the first glance. However, present value of net cash flows and internal rate of return are more important factors of the investor's appraisal criteria.

Cash Flow Statement

Net cash flow is the difference between cash inflows and cash outflows. Cash inflows are net income plus depreciation and amortization expenses. Cash outflows are project cost for the first year and loan repayment and working capital for the subsequent years. Table 24 summarizes the estimated net cash flows.

Table 24: Estimated Net Cash Flow (1,000 USD)

Y-1	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8 to Y+10
0	5,043	8,711	17,801	19,170	20,315	22,201	22,632	29,415

Net cash flows increase each year and reaches around 30 million US dollars after the eighth year.

Balance Sheet

Estimated balance sheet shows the total assets versus total equity. Total assets reach to 230 million US dollars in tenth year. The portion of equity in this total assets increase each year. This very rough balance sheet estimation strengthens the project's viability.

IV.3.2.8. Appraisal Criteria

Appraisal criteria used in the case are present value of net cash flows and internal rate of return.

The present value of the project is 67 million US dollars on 8.5% discounting rate. Internal rate of return on the other hand is 15%, twice the discounting rate.

These two values make the project attractive and viable financially. Hence, Vestel's strategy to offer the market a full line of products both in brown goods (television sets, audio devices) and white goods is consistent with the results of the project analysis. This means that, Zorlu Holding should invest in the project.

V. CONCLUSION

Due to their vital influences on both investors and the society, investment projects should be examined and evaluated carefully before implementation. This evaluation process is called project analysis. Project managers and investors, therefore, need a systematic project analysis process framework in order to carry out the process of project analysis. Otherwise, projects may turn into a failure harming not only the investors but also the society.

Any project passes through the phases of project conception, opportunity check, feasibility study, investment and operating activities, and post project evaluation.

Feasibility study is a very important element of project analysis and investment and operating activities should not be started before conducting a feasibility study. Feasibility study consists of serial steps of techno-economic, financial and economic analyses.

Objectives of feasibility studies are to justify the projects' financial and economic costs and benefits, and to guide the entrepreneurs in deciding whether to implement them or not.

V.1. CONTRIBUTION OF THIS STUDY

This thesis first performed a literature survey on project analysis and feasibility study methods. Then, the study proposes a project analysis framework by focusing on feasibility study for investment projects. This framework is then applied to a real life investment project to examine its financial viability.

The project, namely construction of a new refrigerator facility, have been examined in several aspects such as foreign and domestic markets for the products to be produced, project technology, product and process specifications, parts, material, equipment and construction costs. Data obtained from this investigation have been used to conduct a feasibility analysis.

As a result, the investor has obtained a valuable data source about its project before implementing it. Moreover, the proposed project analysis framework and feasibility study outline can be used to evaluate other investment projects. According to investment appraisal criteria (Net Present Value and Internal Rate of Return), the result of the feasibility study is positive. This urges the investor to implement the project. A new, high technology consumer durable plant is going to be established in Turkey within a year. This will also contribute to the country's national product.

V.2. FURTHER RESEARCH AREAS

In the case study, the project is evaluated in terms of the investor's point of view. That is, only the financial feasibility is checked. Another study may perform an economic

analysis on the project so that its effects on not only the investor but also the society and the government can be put forward. Such an economic analysis would be necessary when applying to multinational financial institutions for long term credit.

After the project is implemented, another study may perform a post project analysis to compare the estimated figures with actual ones. It can draw out the differences between estimated and actual values and try to explain them.

This analysis is done using U.S. Dollars as the currency unit. Using nominal currency unit (Turkish Lira), another study may evaluate the project viability again. This time, the effect of inflation and exchange rate fluctuations should be taken into account in the calculations. Such an analysis would yield more realistic results.

Almost all of the assumptions about the data used upto now are based on estimations which express the investor's expectations about the future. The future expectations depend on economic, social and political environment of the investment and also on the specific project data. There may be uncertainties in these assumptions. As an example, a change in sales volume or decrease in sales prices affects not only the sales revenue, but also the net working capital, costs, cash flows and finally net present value and internal rate of return of the project. In fact, after customs union a decrease in domestic sales prices is going to be inevitable since there is a big gap between domestic and export prices. Therefore, economic uncertainty and estimation of it in investment appraisal is an important subject and need further study. A sensitivity analysis, for example, can be employed to see the project's viability under different scenarios.

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APPENDICES

APPENDIX A

UTILITY REQUIREMENTS, PRODUCT SPECICATION, AND PART AND EQUIPMENT SUPPLY PLANS

A.1. Utility Requirements of the Plant

The plant is going to use electricity, compressed air, cooling water and steam. The suppliers of machinery and equipment determined the following utility requirements.

Description	Requirement	Remarks
Electricity (kW)	6,400	-
Compressed Air (Nm^3/Min)	100	7Kgf/cm^2
Cooling Water (L/Min)	7,300	Recycled, 2Kgf/cm^2
Steam (Kg/Hr)	4,000	2gf/cm^2

A.2. Specification of Products

Product specifications and features are determined according to the market needs. I have worked with Vestel Marketing Department and product managers to prepeare the specifications.

Description	Specification
Model Size	FR430, FR490, FR540
Cooling Method Defrosting Defrost Control	Forced Convection Defrosting Heater Electronic Control
Voltage and Frequency	220V/50Hz
Features	• Clear Back Design • Frost-Free Freezing • Fashionable Round Door • Deluxe Adjustable Legs and Built-in Rollers • Low Power Consumption by Complete Insulation • Multi Air-flow for freezer and Refrigerator compartments

A.3. Equipment Supply Plan for Machinery and Equipment

	Supply By	
Main Machinery and Equipment	**Domestic**	**Foreign**
Sheet Metal Shop		X
Vacuum Forming Shop		X
Urethane Foaming Shop		X
Assembly Shop		X
EPS Foaming Shop		X
Extrusion Shop • Gasket Extrusion Line • ABS Sheet Extrusion Line	 X X	
Parts Processing Shop • Pipe Processing Line • Evaporator Processing Line		 X X
Testing Instrument		X
Maintenance Shop		X
Mold & Dies		X
Utility Equipment • Electricity - Compressed Air • Cooling Water - Steam	 X X	
Waste Water Treatment System	X	
Anti Pollution System	X	
Fire Fighting System	X	

A.4. Parts Supply Plan

	Supply By	
Description	**Domestic**	**Foreign**
Metallic Parts		
• Supply of steel plate	X	
• Parts processing by press	X	
• Painted parts by sub-contractor	X	
Dimensioned Precoated Metal (PCM)	X	
Kinds of Tube		
• Double wall steel tube	X	
• Copper and Capillary Tube	X	
Evaporator Assembly (Fin Evaporator)		
• Aluminum sheet and pipe	X	
• Joint Pipe	X	
• Accumulator	X	
Electrical Parts		
• Compressor with Relay		X
• Door Switch and so on		X
Styrofoam Pad and materials	X	
Vacuum Forming Materials		
• Resin for extrusion of ABS sheet	X	
Injection Molding Large Parts		
• Resin for injection	X	
Injection Molding Small Parts		
• Resin for injection		X
Extruding Parts and Materials		
• Resin for extrusion of Gasket	X	
• Magnet and Sponge	X	
• Extruding Parts	X	
Urethane Foaming Material (Non-CFC)		
• Polyol	X	
• Isocyanate	X	
• C-Pentane	X	
Kinds of Bolt and Screw	X	X
Welding bar and flux	X	
Replaced refrigerant	X	
Oxygen, Nitrogen and Acetylene Gas	X	
Packing materials	X	
Kind of tape and sealing materials	X	

APPENDIX B

CALCULATION OF PROJECT COST

USD

DESCRIPTION	Y-1 1996	Y+1 1997	Y+2 1998	Y+3 1999	TOTAL
LAND COST	1,080,000	0	0	0	1,080,000
BUILDING	2,600,000	0	0	0	2,600,000
EQUIPMENT AND MOLD	34,813,694	0	0	0	34,813,694
IMPORT AND CUSTOM COST	1,937,625	0	0	0	1,937,625
CUSTOM TAX AND CHARGES	2,240,000	0	0	0	2,240,000
VEHICLE AND OFFICE FACILITIES	293,000	0	0	0	293,000
PRE-OPERATION EXPENSES	600,000	0	0	0	600,000
INTEREST DURING CONSTRUCTIO	2,500,000	0	0	0	2,500,000
TECHNICAL DOCUMENT FEE	450,000	0	0	0	450,000
SUPERVISION FEE	731,000	0	0	0	731,000
TRAINING FEE	210,000	0	0	0	210,000
WORKING CAPITAL	8,613,403	4,529,622	9,143,764	5,761,316	28,048,104
GRAND TOTAL	**56,068,722**	4,529,622	9,143,764	5,761,316	**75,503,423**

APPENDIX C

MATERIAL AND INVENTORY PLANS

C.1. Material Plan (1,000 USD)

MODEL	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6 to Y+10
FR-430						
Domestic	21,560	28,910	37,485	43,610	44,100	44,100
Export	-	-	8,085	11,515	11,760	11,760
FR-490						
Domestic	6,417	11,813	20,271	25,813	26,250	26,250
Export	-	-	6,417	10,208	10,500	10,500
FR-540						
Domestic	6,741	12,410	21,296	27,118	27,578	27,578
Export	-	-	6,741	10,725	11,031	11,031
Domestic Total	34,718	53,132	79,052	96,540	97,928	97,928
Export Total	0	0	21,243	32,448	33,291	33,291
GRAND TOTAL	**34,718**	**53,132**	**100,295**	**128,988**	**131,219**	**131,219**

C.2. Inventory Plan (Quantity)

MODEL	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6 to Y+10
FR-430 DOMESTIC	6,667	8,333	10,833	12,500	12,500	12,500
FR-430 EXPORT	-	-	2,500	3,333	3,333	3,333
FR-490 DOMESTIC	1,667	2,917	5,000	6,250	6,250	6,250
FR-490 EXPORT	-	-	1,667	2,500	2,500	2,500
FR-540 DOMESTIC	1,667	2,917	5,000	6,250	6,250	6,250
FR-540 EXPORT	-	-	1,667	2,500	2,500	2,500
DOMESTIC TOTAL	10,000	14,167	20,833	25,000	25,000	25,000
EXPORT TOTAL	-	-	5,833	8,333	8,333	8,333
GRAND TOTAL	**10,000**	**14,167**	**26,667**	**33,333**	**33,333**	**33,333**

APPENDIX D

SALES QUANTITIES

Sales Quantity	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6 to Y+10
FR-430						
Domestic	73,333	98,333	127,500	148,333	150,000	150,000
Export	-	-	27,500	39,167	40,000	40,000
FR-490						
Domestic	18,333	33,750	57,917	73,750	75,000	75,000
Export	-	-	18,333	29,167	30,000	30,000
FR-540						
Domestic	18,333	33,750	57,917	73,750	75,000	75,000
Export	-	-	18,333	29,167	30,000	30,000
Domestic Total	110,000	165,833	243,333	295,833	300,000	300,000
Export Total	0	0	64166.67	97500	100000	100000
GRAND TOTAL	**110,000**	**165,833**	**307,500**	**393,333**	**400,000**	**400,000**

APPENDIX E

EXPENSES

E.1. Direct Expenses

Description	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8	Y+9	Y+10
1. ELECTRIC POWER (USD)	**430**	**609**	**1,147**	**1,434**	**1,434**	**1,434**	**1,434**	**1,434**	**1,434**	**1,434**
(6,400 kwh x 0 07 USD)										
2. CONSUMABLE TOOLS	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**	**52**
(%) ON MAC.&EQP.COST	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%
3. REPAIRS&MAINTENANCE	**348**	**366**	**384**	**403**	**423**	**444**	**467**	**490**	**514**	**540**
(%) ON MAC.&EQP.COST	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
YEARLY INCREMENT (%)	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
4. FACTORY SUPPLIES	**117**	**177**	**315**	**399**	**406**	**406**	**406**	**406**	**406**	**406**
(%) ON SALES REVENUE	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%
5. TRAVEL COST	**117**	**177**	**315**	**399**	**406**	**406**	**406**	**406**	**406**	**406**
(%) ON SALES REVENUE	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%
6. WELFARE (USD/DAY/MAN)	**208**	**299**	**415**	**596**	**596**	**596**	**596**	**596**	**596**	**596**
USD/DAY/MAN	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
7. INSURANCE	384	329	270	213	197	133	114	50	71	48
(%) ON FIXED ASSETS	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
8. VEHICLE MAINT. COST	29	29	29	29	29	29	29	29	29	29
9. COMMUNICATION COST	**175**	**266**	**472**	**599**	**609**	**609**	**609**	**609**	**609**	**609**
(%) ON SALES REVENUE	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
10. ROYALTY	**1,167**	**1,772**	**2,618**	**3,190**	**3,236**	**0**	**0**	**0**	**0**	**0**
(%) EX-FACTORY PRICE	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
ROYALTY PERIOD (YEARS) : 5										
11. OTHERS	**151**	**204**	**301**	**366**	**369**	**205**	**206**	**204**	**206**	**206**
(%) ON EXPENSES	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
TOTAL	**3,178**	**4,281**	**6,318**	**7,681**	**7,758**	**4,315**	**4,319**	**4,276**	**4,324**	**4,327**

E.2. Depreciation and Amortization Expenses

DEPRECIATION ITEM	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8	Y+9	Y+10
BUILDING	130	130	130	130	130	130	130	130	130	130
MACHINERY AND EQP.	4,973	4,973	4,973	4,973	4,973	4,973	4,973	0	0	0
VEHICLE & OFFICE SUP.	59	59	59	59	59	0	0	0	0	0
TOTAL DEPRECIATION	**5,162**	**5,162**	**5,162**	**5,162**	**5,162**	**5,103**	**5,103**	**130**	**130**	**130**
AMORTIZATION ITEM										
PRE-OPERATION EXP.	120	120	120	120	120	0	0	0	0	0
OTHER	1,614	1,614	1,614	1,614	1,614	0	0	0	0	0
TOTAL AMORTIZATION	**1734**	**1734**	**1734**	**1734**	**1734**	**0**	**0**	**0**	**0**	**0**
GRAND TOTAL	**6,896**	**6,896**	**6,896**	**6,896**	**6,896**	**5,103**	**5,103**	**130**	**130**	**130**

E.3. Selling, General and Administrative Expenses

DESCRIPTION	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8	Y+9	Y+10
SALES ADMINIS. COST 5% ON SALES	2,917	4,431	7,865	9,986	10,152	10,152	10,152	10,152	10,152	10,152
INDIRECT LABOR COST	380	380	567	567	567	567	567	567	567	567
ADVERTISING COST	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
OTHERS 10% ON ABOVE	505	656	1,018	1,230	1,247	1,247	1,247	1,247	1,247	1,247
TOTAL	**5,553**	**7,217**	**11,200**	**13,533**	**13,715**	**13,715**	**13,715**	**13,715**	**13,715**	**13,715**

APPENDIX F

CALCULATION OF WORKING CAPITAL

DESCRIPTION	PERIOD Days	Y+1	Y+2	Y+3	Y+4	Y+5 to Y+10
1. DOMESTIC						
ACCOUNT RECEIVABLE	30	4,862	7,384	10,909	13,293	13,482
INVENTORY OF GOODS	30	2,893	4,428	6,588	8,045	8,161
INVENTORY OF MATERIAL		6,234	9,561	14,251	17,414	17,664
LOCAL	30	1,223	1,861	2,756	3,361	3,409
IMPORT	90	5,012	7,699	11,494	14,053	14,256
ACCOUNT PAYABLE	60	5,786	8,855	13,175	16,090	16,321
2. EXPORT						
ACCOUNT RECEIVABLE	10	0	0	733	1,117	1,146
INVENTORY OF GOODS	30	0	0	1,770	2,704	2,774
INVENTORY OF MATERIAL		0	0	1919.42	2933.9	3010.21
LOCAL	15	0	0	368	561	576
IMPORT	45	0	0	1,551	2,373	2,435
ACCOUNT PAYABLE	30	0	0	1,770	2,704	2,774
3. CASH		410	626	1,062	1,336	1,357
CUMULATIVE WORKING CAPITAL		8,613	13,143	22,287	28,048	28,499
NET WORKING CAPITAL		8,613	4,530	9,144	5,761	451
TURNOVER						

APPENDIX G

FINANCIAL STATEMENT ESTIMATIONS

G.1. Estimated Income Statement

(1,000 USD)

DESCRIPTION	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8 to Y+10
SALES REVENUE	**58,346**	**88,610**	**157,300**	**199,725**	**203,033**	**203,033**	**203,033**	**203,033**
EXPORT	0	0	26,386	40,211	41,250	41,250	41,250	41,250
DOMESTIC	58,346	88,610	130,914	159,513	161,783	161,783	161,783	161,783
COST OF GOODS SOLD	**44,892**	**65,210**	**115,994**	**147,893**	**150,597**	**147,096**	**147,099**	**142,083**
MANUFACTURING COST	39,730	60,048	110,832	142,731	145,435	141,992	141,996	141,953
DEPRECIATION	5,162	5,162	5,162	5,162	5,162	5,103	5,103	130
GROSS PROFIT	**13,454**	**23,400**	**41,305**	**51,832**	**52,435**	**55,937**	**55,933**	**60,949**
SELLING, GENERAL & ADMIN. EXPENSES	**5,553**	**7,217**	**11,200**	**13,533**	**13,715**	**13,715**	**13,715**	**13,715**
OPERATING PROFIT	**7,902**	**16,183**	**30,105**	**38,298**	**38,720**	**42,221**	**42,218**	**47,234**
NON-OPERATING EXPENSES	**5,225**	**5,225**	**5,225**	**4,526**	**3,828**	**1,396**	**698**	0
INTEREST PAYMENTS	3,491	3,491	3,491	2,793	2,095	1,396	698	0
AMORTIZATION	1,734	1,734	1,734	1,734	1,734	0	0	0
NET INCOME BEFORE TAX	**2,677**	**10,958**	**24,881**	**33,772**	**34,892**	**40,825**	**41,520**	**47,234**
INCOME TAX	**0**	**0**	**0**	**12,833**	**13,259**	**15,513**	**15,777**	**17,949**
NET INCOME	**2,677**	**10,958**	**24,881**	**20,938**	**21,633**	**25,311**	**25,742**	**29,285**

G.2. Estimated Cash Flow Statement

(1,000 USD)

DESCRIPTION	Y-1	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8	Y+9	Y+10
CASH INFLOW	56,069	9,573	17,854	31,776	27,834	28,529	30,415	30,846	29,415	29,385	29,384
EQUITY	15,000	0	0	0	0	0	0	0	0	0	0
LOAN	41,069	0	0	0	0	0	0	0	0	0	0
NET INCOME	0	2,677	10,958	24,881	20,938	21,633	25,311	25,742	29,285	29,255	29,254
DEPR. & AMORT.	0	6,896	6,896	6,896	6,896	6,896	5,103	5,103	130	130	130
CASH OUTFLOW	56,069	4,530	9,144	13,975	8,664	8,214	8,214	8,214	0	0	0
LAND&BUILDING	3,680	0	0	0	0	0	0	0	0	0	0
M/C & EQUIPMENT	34,814	0	0	0	0	0	0	0	0	0	0
COST OF IMPORT	4,178	0	0	0	0	0	0	0	0	0	0
VEH. & OFFICE EQ.	293	0	0	0	0	0	0	0	0	0	0
WORKING CAPITAL	8,613	4,530	9,144	5,761	451	0	0	0	0	0	0
OTHER	4,491	0	0	0	0	0	0	0	0	0	0
REPAY LOAN	0	0	0	8,214	8,214	8,214	8,214	8,214	0	0	0
CASH FLOW											
NET	0	5,043	8,711	17,801	19,170	20,315	22,201	22,632	29,415	29,385	29,384
CUMULATIVE	0	5,043	13,754	31,555	50,725	71,040	93,241	115,873	145,288	174,673	204,057
DISCOUNTED	(56,069)	4,648	7,399	13,937	13,832	13,510	13,608	12,785	15,316	14,101	12,996

G.3. Estimated Balance Sheet

(1,000 USD)

DESCRIPTON	Y-1	Y+1	Y+2	Y+3	Y+4	Y+5	Y+6	Y+7	Y+8	Y+9	Y+10
ASSETS											
1. CURRENT ASSETS	8,613	18,186	36,040	59,603	79,223	99,538	121,739	144,371	173,786	203,172	232,555
CUMULATIVE CASH FLOW	0	5,043	13,754	31,555	50,725	71,040	93,241	115,873	145,288	174,673	204,057
CUMULATIVE WORKING CAP.	8,613	13,143	22,287	28,048	28,499	28,499	28,499	28,499	28,499	28,499	28,499
2. FIXED ASSETS	38,787	33,625	28,463	23,301	18,139	12,977	7,873	2,770	2,640	2,510	2,380
LAND	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080
BUILDING	2,600	2,470	2,340	2,210	2,080	1,950	1,820	1,690	1,560	1,430	1,300
M/C & EQUIPMENT	34,814	29,840	24,867	19,894	14,920	9,947	4,973	0	0	0	0
VEH. & OFFICE EQ.	293	234	176	117	59	0	0	0	0	0	0
3. AMORTIZED ASSETS	8,669	6,935	5,201	3,467	1,733	0	0	0	0	0	0
PRE-OPERATION	600	480	360	240	120	0	0	0	0	0	0
OTHER	8,069	6,455	4,841	3,227	1,613	0	0	0	0	0	0
TOTAL ASSETS	56,069	58,746	69,704	86,371	99,096	112,515	129,613	147,141	176,426	205,682	234,935
LIABILITIES AND EQUITY											
1. LIABILITY	41,069	41,069	41,069	32,855	24,641	16,427	8,214	0	0	0	0
LONG TERM LOAN	41,069	41,069	41,069	32,855	24,641	16,427	8,214	0	0	0	0
2. EQUITY	15,000	17,677	28,635	53,516	74,454	96,087	121,399	147,141	176,426	205,681	234,935
CUMULATIVE EQUITY	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
CUMULATIVE NET INCOME	0	2,677	13,635	38,516	59,454	81,087	106,399	132,141	161,426	190,681	219,935
TOTAL LIABILITY AND EQUITY	56,069	58,746	69,704	86,371	99,096	112,515	129,612	147,141	176,426	205,681	234,935

ÇİFTÇİ, Türker

Türker Çiftçi was born in Silifke, in 1972. He had graduated from Middle East Technical University Department of Electrical and Electronics Engineering, Ankara, in 1993. In the same year, he registered to the Graduate School of Business Administration of Bilkent University, Ankara. Between the years 1993 and 1995 he had worked as a project planning engineer at ASELSAN Military Electronics Industries Inc., Ankara. Since 1995, he is working as a project manager in Vestel Group of Companies, İstanbul.